

QUALIFICATION REQUIREMENTS FOR MANUFACTURE OF PROPULSION CRITICAL APPLICATION ITEMS

1. APPLICATION.

1.1. This Qualification Requirement applies to propulsion items determined to be Critical Application Items that are not classified as Critical Safety Items.

2. DEFINITIONS.

2.1. **Approval Part/Item** - Part/Item for which source approval is sought.

2.2. **Category 1 Offeror** - A manufacturing source, which in conjunction with their sub-vendors has performed all requisite processes on the approval part, for the OEM or a DoD Propulsion system. Sub-vendors are subject to approval by Cognizant Engineering Authority.

2.3. **Category 2 Offeror** - Manufacturing source, which in conjunction with their sub-vendors has performed all requisite processes on a similar part for an OEM or a DoD Propulsion system. Sub-vendors are subject to approval by the Cognizant Engineering Authority.

2.4. **Cognizant Engineering Authority** - The USAF engineering branch chief for the respective propulsion system.

2.5. **Critical Characteristic** - Any feature throughout the life cycle of a Critical Item, such as dimension, tolerance, finish, material, or assembly, manufacturing or inspection process, operation, field maintenance, or depot overhaul requirement that if non conforming, missing, or degraded may cause the failure or malfunction of the Critical Item.

2.6. **Critical Application Item (CAI)** - An item that is essential to weapon system performance or operation, or the preservation of life or safety of operating personnel, as determined by the military services. The subset of CAIs whose failure could have catastrophic or critical safety consequences (Category I or II as defined by MIL-STD-882) is called CSIs.

2.7. **Critical Safety Item** - A Critical Safety Item (CSI) is a part, assembly, installation or production system with one or more critical or critical safety characteristics that, if missing or not conforming to the design data or quality requirements, would result in an unsafe condition that could cause loss or serious damage to the end item or major items, loss of control, uncommanded engine shutdown, or serious injury or death to personnel. Unsafe conditions relate to hazard severity categories I and II of MIL-STD-882, System Safety

Requirements. The determining factor in CSIs is the consequence of failure, not the probability that the failure or consequence would occur.

2.8. **Fabricate** - The manufacturing steps necessary for the making of new parts.

2.9. **Inspection Method Sheets (IMS)** - document used to describe the steps involved in executing an inspection or series of inspections to include tooling, gages, fixtures, dimensions and other parameters necessary to execute the required inspections(s).

2.10. **Major Characteristics** - A part feature which, if non-conforming, could compromise the function of the part, resulting in a significant maintenance burden and/or reduction in weapon system performance.

2.11. **Manufacturing Process Sheets (MPS)** - documents used to describe the steps involved in executing an operation or series of operations to include tooling, machinery, dimensions, speeds, feed rates, coolants, cutters, tape numbers and other operating, process and/or set-up parameters necessary to execute the operation. At a minimum, significant processes in Appendix A shall be fully defined.

2.12. **Material** - A general term referring to material at any stage in the manufacturing process.

2.13. **National Aerospace and Defense Contractors Accreditation Program (NADCAP)** – The Performance Review Institute (PRI), an independent, not-for-profit trade association affiliated with the Society of Automotive Engineers (SAE) through NADCAP, accredits subcontractors and suppliers to aerospace and defense industry consensus standards.

2.14. **NIST** - National Institute of Standards and Technology.

2.15. **Offeror** - Company furnishing a source approval package in an attempt to obtain engineering source approval to supply the approval part in its finished state to OC-ALC.

2.16. **Original Equipment Manufacturer (OEM)** - Term typically applied to the source responsible for the original design and development of a product or system. In this case, it shall refer to sources primarily responsible for the design and development of aircraft gas turbine engines for a US DoD activity or a NATO country.

2.17. **Production Quantities** - Quantities that establish a reasonable level of confidence in a prospective source's ability to consistently produce parts whose integrity is equivalent to that exhibited by parts that originally passed

substantiation testing. As a minimum, it shall be considered representative of several production lots or greater quantities commensurate with those specified in current solicitations or OC-ALC annual buy projections and shall be exclusive of quantities produced in experimental or developmental programs.

2.18. Purchaser - The Purchaser as defined in all applicable government specifications as well as all OEM specifications relative to the part described in this document shall refer to the OC-ALC contracting activity issuing the procurement requirement.

2.19. Raw Material - Ingot, bar, billet, or sheet stock used directly in the fabrication of the finished part or forgings/castings used in the fabrication of the finished part.

2.20. Significant Process - A process which is capable of producing alterations in the material structure of a part which cannot normally be evaluated without destructive testing and which can compromise the mechanical properties and ultimately the reliability of the part. Examples of processes that are considered to be significant by OC-ALC/LP are listed in Appendix A.

2.21. Similar part - A part that satisfies all of the specific criteria for similarity as defined in the QR's for the approval part.

2.22. Sub-vendor - A source supplying material, products, and/or services to the Supplier as required in the performance of the contract. This term applies to all facilities other than the Supplier's facility including those of the same company.

2.23. Technical Order - A technical manual published by the Air Force containing (in this case) technical information required to develop inspection methods processes for aircraft engine parts.

3. SCOPE

3.1. This document establishes the minimum technical requirements which prospective sources must satisfy in order to obtain engineering source approval for the specified applications.

3.2. All documentation provided in a Source Approval Request (SAR) must be in the English language and the measurement system used on the OEM drawing. Cost data may be removed from documentation.

3.3. Engineering source approval shall be valid for five years from the date of the OC-ALC letter notifying the contractor of engineering source approval. Approved sources will be required to resubstantiate their capability. Resubstantiation shall involve documenting that no significant changes to

process location, sequence, or parameters have occurred, the offeror has the current drawings and specifications, and no significant quality deficiencies are awaiting corrective action. Significant changes or unresolved quality deficiencies may result in additional testing, or revocation of source approval status, depending on the nature and extent of the changes and/or quality deficiencies. Resubstantiation is valid for five years from the date approval would expire and may be submitted six months prior to previous approval expiration.

4. CONTRACTOR RESPONSIBILITY STANDARDS: (FAR 9-104)

4.1. Offerors must submit a complete technical data package on all similar items as specified in Paragraph 7.

4.2. Offerors must submit a complete technical data package on the approval item as specified in Paragraph 7.

4.3. General standards as specified in FAR 9-104.1 apply.

4.4. Special standards as specified in FAR 9-104.2 apply.

4.4.1. The specific special standards to be applied are Category 1 Offeror and Category 2 Offeror .

5. PROOF OF CAPABILITY. (FAR 9.105-1, FAR 9.200)

5.1. Proof of satisfactory manufacture of production quantities of the approval item or a similar item within the last five years for an OEM or a DoD Propulsion system.

5.1.1. The "similar" item must satisfy the following criteria for similarity:

5.1.1.1. Used in a proven aircraft turbofan or turbojet engine.

5.1.1.2. Fabricated of the same or a similar material that is equivalent or more difficult to form and finish manufacture.

5.1.1.3. An item which demonstrates the ability of the prospective source, in conjunction with their subvendors, to perform all requisite significant manufacturing processes applicable per the item drawing and sub-tier specifications traced from the drawing. Significant processes are defined in Appendix A.

5.1.2. Multiple items may be used to demonstrate compliance with 5.1.1, provided that such items satisfy the criteria defined in 5.1.1.1 through 5.1.1.3.

5.1.3. The determination of similarity is subject to approval by the Cognizant Engineering Authority (CEA).

5.2. The Offeror shall substantiate proof of capability with documentation tailored to the requirements of 5.1 and which satisfies the basic technical data package requirements specified in Paragraph 7.

5.3. Identify all sources of raw material, assembly details, and significant processes used to manufacture the item. Identification shall include the specific operations to be performed by each source, and the address of the plant where operations are to be performed. Processes and assembly details to be performed or produced in-house by the Offeror shall be identified as such for both Category 1 and Category 2 Offerors. Approval shall be restricted to the following conditions:

5.3.1. When forgings and/or castings are required for manufacture of the item, the Offeror shall substantiate that source(s) for castings and/or forgings are currently approved by the OEM or CEA or provide a rationale proving to the CEA that the casting or forging source is capable of manufacturing the subject part to the equivalent or better OEM or CEA quality standards.

5.3.2. The Offeror shall substantiate that all source(s) for all detail items, are currently approved by the OEM or CEA or provide a rationale proving to the CEA that the source is capable of manufacturing the subject part to the equivalent or better OEM or CEA quality standards.

5.3.3. The Offeror shall substantiate that source(s) to be employed for each significant process, including themselves, are currently approved by an OEM, NADCAP, or the CEA.

5.3.4. In all instances where substantiation of OEM approval is used, the Offeror shall include a copy of the official OEM process certification and all conditions and restrictions imposed by the OEM.

5.3.5. In all cases where process approval substantiation is based upon approval by an OEM not specified on the drawing or by NADCAP to perform an equivalent process, the equivalence of the specifications must be clearly demonstrated by the Offeror in order to obtain the approval of the Cognizant Engineering Authority. Evidence shall include, but not be limited to, a complete copy of the relevant specifications.

6. QUALITY

6.1. The Offeror shall provide evidence that the quality assurance system and available expertise which currently exists within the Offeror's facility, is capable of establishing and maintaining effective process control, and otherwise ensuring

the ongoing quality of all significant processes performed in-house and by subvendors. Evidence shall comply with the following criteria:

6.1.2. The Offeror must provide all documentation required in Paragraph 7 to include a Quality Assurance Manual that accurately portrays their current quality assurance system.

6.2. The Offeror shall provide a quality plan specifically tailored to approval item and documented according to Paragraph 7.

7. DOCUMENTATION REQUIREMENTS

7.1. A complete set of legible drawings for all assemblies, details, and sub-components. Drawings shall be the latest revision.

7.2. A complete set of all drawing referenced specifications (top page only for OEM developed specifications) for all materials and manufacturing processes identified on the drawings for the similar parts and sub-components thereof. Documents referenced by drawing referenced specifications that apply to the manufacture of the drawing part, or equivalent documents or procedures approved by the CEA.

7.3. A detailed description of major similarities and differences between the "similar" part(s) and the approval part.

7.4. Copies of purchase orders from purchaser to Offeror and Offeror to sub-vendors that define quantities ordered and all technical conditions or restrictions imposed.

7.5. Copies of documentation verifying acceptance of parts supplied on the applicable purchase orders. For example, shipping documents stamped by the purchaser to indicate full release where on-site acceptance is specified by the purchase order is acceptable.

7.6. A complete set of MPS and IMS to include:

7.6.1. MPS and IMS employed in the production of the actual part for Category 1 offerors or the similar part(s) for Category 2 offerors. When OEM approval of the MPS is required by the OEM for the actual or similar part, evidence of OEM approval of the MPS shall be provided. Summary of manufacturing operations sheets, travelers, or routing sheets are not acceptable in lieu of MPS, except for some sheet metal parts. In the case of the latter routing sheets that define process sequence, forming tooling, non-conventional machining schedules, weld schedules, and braze schedules shall be provided. All schedules and technical control documents referenced in the MPS that

specify process operating parameters shall be included. MPS shall remain confidential and may be stamped "proprietary" at the discretion of the Offeror.

7.6.2. A summary of manufacturing process sheets, travelers, or routing sheets that identify all significant manufacturing processes **to be employed in the fabrication of the approval part** for OC-ALC. This documentation is subject to approval by CEA.

7.6.3. Identification of all proposed changes to the MPS and IMS submitted by Category I Offerors, as proof of capability. This requirement applies regardless of whether or not the Offeror considers them significant changes.

7.7. Identify all sub-vendors of significant processes and sub-components employed in the production of the part(s).

7.8. A summary of quality deficiencies experienced in fabrication of the part during the last two years of production and actions taken to resolve the deficiencies. The summary shall include all Material Review Board (MRB) actions, Quality Deficiency Reports (QDR's), Laboratory Quality Review Orders (LQROs), Supplier Report of Nonconformance (SRONs), Material Deficiency Reports (MDR's) and any other pertinent documentation as well as the coordination of the President or Facility General Manager, and the Quality Assurance Manager. Coordination of the government quality assurance representative shall be included as well if government source inspection was conducted.

7.9. A Quality Assurance Manual that accurately portrays their current quality assurance system, as follows:

7.9.1. The Offeror's Quality Assurance System must comply with the requirements as described in this document and higher level contract quality requirements (FAR52.246-11) of AS9100, NATO AQAP-2070, ISO 9001:2000, or equivalent. Proof of compliance shall be provided, dated within the last three years, and meet one of the following:

7.9.1.1. Certified to AS9100, NATO AQAP-2070, or ISO 9001:2000 by the American National Standards Institute (ANSI) or the International Standards Organization (ISO) in Geneva, Switzerland, or

7.9.1.2. Approved by an Original Equipment Manufacturer (OEM) to an equivalent Quality Assurance System standard, or

7.9.1.3. Evidence from DCMA or other appropriate government Quality Assurance Representative that Quality System is compliant to AS9100, NATO AQAP-2070, or ISO 9001:2000, or equivalent.

8. SAR FORMAT

8.1. Source Approval Requests (SAR's) should be submitted in a binder to preclude the loss of contractor data in handling. A notebook (i.e. a three-ring binder or similar product), with a table of contents and tabs corresponding to the table of contents is preferable. This will significantly reduce the turn-around time for engineering evaluation as well as reduce the likelihood of oversight or loss of valuable data that could have a significant bearing on the outcome of the evaluation. The Quality Manual may be submitted on a CD in a standard Microsoft Office application or .pdf file format.

9. LOSS OF QUALIFICATION APPROVAL (FAR 9.207)

9.1. The Offeror should be aware that qualification approval may be lost per the conditions detailed in FAR 9.207.

10. USE OF PROPRIETARY DATA IN SOURCE APPROVAL REQUESTS

- 10.1 Potential sources are not to utilize intellectual property of third parties without appropriate authorization of the intellectual property owner. Potential sources are cautioned that no part of the government qualification requirement is intended to endorse or encourage the improper use of intellectual property developed by the Original Equipment Manufacturer or any other third party.

Approved:

Chief of Contracting Office Henry J. Gaudreau Date 23 Jan 04
Expires 7 Years After Date of Approval Signature

HENRY J GAUDREAU, Col, USAF
Chief, Propulsion Contracting Division
Directorate of Propulsion

APPENDIX A

SIGNIFICANT PROCESSES

The following examples are typical processes considered significant in that they are capable of producing alterations to material structures, mechanical properties, and ultimately, item reliability, if performed improperly, and cannot normally be evaluated without destructive testing.

1. Casting Processes
2. Forging Processes
3. Other Forming Processes
4. Broaching
5. Blending/Reworking
6. Heat Treatment and Surface Hardening Processes
7. Grinding
8. Drilling, Reaming, and Boring
9. Milling
10. Finish Turning
11. Electrochemical Machining Processes (Cavity Sinking, Drilling, Grinding, etc.)
12. Chemical Milling
13. Electro-Discharge Machining
14. Electro-Stream Drilling
15. Laser Beam Metal Removal Processes
16. Electron Beam Processes
17. Peening Processes
18. Welding/Fusion
19. Brazing
20. Soldering
21. Metal Electroplating Processes
22. Coating Processes including, but not limited to, the following:

- a. Plasma Spray
 - b. Thermal Spray,
 - c. Diffusion Coatings
 - d. Thermal Barrier Coatings
23. Surface Finishing Processes including, but not limited to, the following:
- a. Honing
 - b. Sutton Barrel
24. Blasting Processes including, but not limited to, the following:
- a. Aluminum Oxide
 - b. Silicon Carbide
 - c. Plastic Bead
 - d. Glass Bead
25. Dimensional Inspection/Tolerancing
26. Non-Destructive Inspections, including, but not limited to the following:
- a. Fluorescent Penetrant
 - b. Eddy Current
 - c. Ultrasonic
 - d. Laser Holography
 - e. Magnetic Particle Inspection
 - f. Visual Inspection
 - g. Radiography
27. Water-jet Stripping
28. Assembly Procedures
29. Disassembly Procedures